

## **The 2007 Utah Tularemia Outbreak Summary**

### **What is Tularemia?**

Tularemia, also known as “Rabbit Fever,” is a potentially serious illness that occurs naturally in Utah. Tularemia is caused by the bacterium *Francisella tularensis* (*F. tularensis*). These bacteria can be found in animals (especially wild animals, such as rabbits) and can be passed to humans through direct contact or by a bite from a deerfly or tick that had previously bitten an infected animal.

Anyone that spends time outdoors, in areas where animals, deerflies or ticks infected with tularemia can be found could be exposed to and infected with tularemia. Most tularemia cases occur during the summer months when deerflies and ticks are abundant and during the rabbit-hunting season.

Symptoms of tularemia usually show up three to five days after exposure, but can show up in as little as one day or as long as 21 days. Common signs and symptoms include: fever, chills, headache, and other flu-like symptoms. Painful swollen lymph nodes and red sores at the point of an insect bite are also symptoms of tularemia.

### **Tularemia Outbreak on the West Side of Utah Lake**

During the summer of 2007, 14 cases of tularemia were reported, and all persons with tularemia had visited the Mosida Lodge located on the west side of Utah Lake in Utah County, Utah. These persons were infected during a three-week period from June 13, 2007 to July 3, 2007. Most had attended youth group activities for the Church of Jesus Christ of Latter Day Saints, while one group attended as a family reunion.

In all, there were nine different groups that participated in outdoor activities at the Mosida Lodge from June 13, 2007 to July 3, 2007. Six of the nine groups had at least one person infected with tularemia, and one group had as many as seven individuals infected with the disease.

The Utah County Health Department was first notified of this unusual disease cluster by a concerned spouse of one of the ill persons. The spouse was concerned because several people from the same church group, who had visited Mosida Lodge, were ill with similar symptoms. Many of the ill had been to see a doctor, but no specific diagnosis as to why they were sick had been provided to them.

Public health officials quickly began investigating these reports of ill persons. A coordinated investigation was conducted with officials from state and local public health departments, wildlife resources, infectious disease doctors, and the Centers for Disease Control and Prevention (CDC). The investigation had several parts: questionnaires for all persons who visited Mosida Lodge, questionnaires for persons diagnosed with tularemia, field investigations and laboratory testing.

This outbreak affected many people. Six of the 14 people infected with tularemia became sufficiently ill that they were hospitalized. The shortest duration for symptoms was 10 days for one person and the longest was 78 days for another person. People were affected both by the symptoms of tularemia, and by the financial burden of medical costs associated with the illness, which for some families exceeded \$25,000.

Questionnaires were distributed to hundreds of people who had visited Mosida Lodge from June 13, 2007 to July 3, 2007. Responses from the questionnaires showed that persons with tularemia were much more likely to report insect bites (particularly deerfly bites) and spending time at the hay barn. Deer flies are a well-known mode of tularemia transmission from an infected wild animal (in this case rabbits) to humans.

Persons with tularemia were also more likely to report use of insect repellent with DEET. This might be because they remembered use of repellent better than persons who did not become ill. Also, we do not know if the repellent was applied appropriately. However, current information from other sources had suggested use of common repellants would not be an effective protection against the biting flies involved in this outbreak.

For the field investigation, personnel from the CDC in Fort Collins, Colorado came to Utah and gathered deer flies, rabbit carcasses, and live animals (deer mice and a kangaroo rat) from the area surrounding Mosida Lodge. Laboratory tests were conducted to determine if they were infected with *F. tularensis*. Overall, nine rabbit carcasses were found to have been infected with *F. tularensis*. None of the deer flies or live rodents was infected with *F. tularensis*, possibly because they were collected in late July after a large rabbit die-off. All 14 persons were infected from June 13, 2007 to July 3, 2007.

Tularemia infection in humans is rare, but does occur in Utah. On average, 2-3 cases of tularemia have been reported each year over the past ten years. Those that spend time outdoors, especially in areas where wild rabbits are found, are at higher risk of getting infected with tularemia. In this outbreak, evidence indicates that deer flies transmitted the infection from rabbits to humans. While it did not appear to play a role in this outbreak, tularemia can also be spread through bites of ticks and possibly mosquitoes, handling infected animals, eating insufficiently cooked meat of infected animals, drinking contaminated water, and breathing in dust from contaminated soil, grain, or hay.

The following can be done to help protect against becoming infected with tularemia:

- Avoid biting insects:
  - Wear long-sleeved shirts and long pants while outdoors.
  - Use mosquito netting when sleeping outdoors or in an unscreened structure.
  - Use mosquito netting to protect small children.
  - Use insect repellent that contains DEET (N, N-diethyl-m-toluamide) while outdoors.
    - Follow all instructions on the label.
    - DEET is more effective against mosquitoes and ticks (which can also transmit tularemia) than some biting flies. If biting flies are a problem, consider using a repellent with DEET plus R-326.
    - It is also important to wear insect repellent with DEET to protect against other diseases, such as West Nile Virus.
- Children should be discouraged from handling sick or dead animals.
- Gloves should be worn when skinning or handling wild animals, especially rabbits.
- Wild rabbit meat should be thoroughly cooked.

Diagnosis was delayed for a number of the infected individuals in this outbreak. This is not surprising given the rarity of this condition. Clinicians should consider tularemia in people with compatible symptoms and signs.

We would like to give a special thanks to all those who helped with this investigation or responded to the questionnaire. Without your help, the investigation would not have been possible.

